



*specialists in environmental technology*  
**SYSTEMS TECHNOLOGY CORPORATION**

245 North Valley Road  
Xenia, Ohio 45335  
Area Code 513/372-8077  
Dayton Toll Free 429-2533

June 20, 1980

US EPA RECORDS CENTER REGION 5



Mr. Don Williams  
Miami Conservancy District  
117 W. Monument  
Dayton, OH 45402

Dear Mr. Williams:

In my letter of June 9, I referred to a forthcoming report being prepared by Mr. Walter Minert. Enclosed is your copy of this document. Also enclosed are several photos of the Franklin Site. These are included to provide you with visual reference of the old Logan Long Discharge Channel and other areas described in Mr. Minert's report.

I will be in contact with you shortly to schedule a meeting regarding this subject.

Sincerely,

SYSTEMS TECHNOLOGY CORPORATION

Thomas J. Wittmann, P.E.  
President

TJW/am

cc: Dr. Dave Howard

Enclosures

RECEIVED JUN 20 1980

Walter M. Meinert, P. E.

CONSULTING ENGINEER

P. O. BOX 6291

GRAND RAPIDS, MICHIGAN 49506

TELEPHONE (616) 949-3121

June 17, 1980

GROUND WATER INVESTIGATIONS & REPORTS  
WELL FIELD ANALYSIS & DESIGN  
EARTH RESISTIVITY SURVEYS

Mr. Thomas J. Wittmann, P.E.  
President  
Systems Technology Corporation  
245 North Valley Road  
Xenia, OH 45385

Dear Mr. Wittmann:

Re: Groundwater Contamination - Systech Waste Treatment Center,  
Franklin, Ohio

In response to our meeting of February 20, 1980 at the office of Mr. Donald Williams of the Miami Conservancy District, I would like to provide the following discussion relative to groundwater conditions at the subject site.

The history of the subject facility indicates that this plant was operated as a municipal wastewater treatment plant from the mid 1930's until 1972, when the Systech Corporation leased the plant. The original plant process included the use of sludge drying beds prior to ultimate sludge disposal. Even though the original design of these sludge beds contained underdrains, it would be expected that nearly forty years of operation of these units would have resulted in rather substantial amounts of moisture entering the underlying groundwater.

Our previous discussions together with inspection of aerial photographs of this site taken during Systech's modification of the plant reveal additional potential sources of groundwater contamination. Of particular interest is the route of an earlier discharge channel used by the former Logan-Long Mill. This mill is situated directly south of the wastewater plant. No specific data is available on the nature of the effluent carried by this channel, however, it is safe to assume that the very existence of the channel provided a high potential for groundwater contamination for a considerable period of time, prior to Systech's operation of the plant. Furthermore, it has been reported that various forms of debris have been used for fill in areas contiguous to the plant property. It was reported that an interval of asphalt shingles were encountered during the drilling of Test Well No. 133. The proximity of Highway US 73 along the south edge of the property could also account for the inclusion of relative high concentrations of chlorides within the groundwater. A review of the local groundwater geometry indicates the direction of groundwater movement to be generally from the southeast towards the northwest. This infers that the application of any road salt to be immediately upgradient from the plant.

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It is my understanding that the initial awareness of any inferior groundwater quality was the result of routine sampling of a series of monitoring wells situated in the vicinity of the subject plant. Namely, these monitoring wells are identified as TW 132, TW 133, and TW 139. Analytical results of water samples from these wells dated November 29, 1977, indicated a degraded groundwater condition especially in the vicinity of TW 139. Unfortunately, no background groundwater quality data is available prior to Systech's operation of this plant. Test well Nos. 132, 133 and 139 were drilled between November 8 and 10, 1977. Water quality procedures were initiated on November 15, 1977.

A small capacity centrifugal pump was installed on TW 139 and used to purge the water bearing materials and provide a degree of regular monitoring of the groundwater quality in this area. Water samples collected from this well early in 1978 revealed the presence of a series of organic solvents within the groundwater. Since a prime function of this plant was solvent recovery and included an area for the storage of drums, it was rather apparent that a portion of the groundwater contamination was the result of plant operating procedures. The location of TW 139 is also nearly directly downgradient from the drum storage area.

It was during our site inspection of the plant in October, 1978, that we became more thoroughly aware of the groundwater conditions. At that time, we also acquainted ourselves with the local geology by reviewing all available information on file at the Miami Conservancy District. It appears that the permeable section which is the recipient of the contamination is an approximate 10 foot thick interval of coarse sand. This saturated interval is bounded on top by a relatively thin layer of clay, sand and gravel, with silt. The interval is bounded below by grey silty clay. This review of the local aquifer hydraulic conditions suggested the installation of a larger diameter purge well to be situated in the approximate center of the plant site.

During our visit to the site on October 10, 1978, it was mentioned that the previously used dosing chamber had also been a possible source of groundwater contamination. The location of the larger diameter purge well was therefore directly downgradient from this chamber. Our conclusions to that meeting were contained in our earlier report to you, dated October 23, 1978.

Subsequent to this earlier report an 8 inch diameter purge well was drilled immediately north of the former clarifiers. This well is referred to as TW 140. The well is thirty-five feet deep and contains an 8 inch telescope size well screen. The screen is 10 feet long and is set in the interval of 25 to 35 feet. Referring to U.S.G.S. datum, the pertinent elevations of monitoring well 140 are as follows:

Land Surface	678.65 feet MSL
Top of Screen	653.65 feet
Bottom of Well	643.65 feet

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The results of pumping TW Nos. 139 and 140 have shown a marked improvement in the groundwater quality. Water quality analyses performed by the Howard Laboratories, Inc. of Dayton and dated March 27, 1980 have indicated that no synthetic organics were present within TW 139 or TW 140.

Regular monitoring of groundwater quality has indicated some fluctuations in the concentration of several parameters. These fluctuations are believed to be primarily due to intermittent and varying pumping rates. This intermittent pumping would tend to create a backwashing type action within the saturated materials in the vicinity of the well. Therefore, if the soil mass, within the saturated zone, contained any contaminants, this backwashing action would have a tendency to yield erratic test results. The amount and frequency of precipitation would also have an effect of carrying any contaminants downward through the dewatered portion of the soil mass into the groundwater.

The operation of the two purge wells (TW 139 and TW 140) were temporarily suspended for approximately ninety days during the winter of 1979-80. The effectiveness of purge well operation can also be seen by laboratory results, performed by the "Howard Laboratories" on samples collected prior to and following the resumption of pumping. These samples were from TW 139 and TW 140 and included the determination of COD, TOC, and BOD. The reduction of these parameters is shown on the following tabulation.

TW 139

<u>Date</u>	<u>COD mg/l</u>	<u>TOC mg/l</u>	<u>BOD mg/l</u>
2/78	920	438	-
10/79	97	68	78
pump off			
12/14/79			
pump on			
2/14/80			
2/19/80	145	75	85
3/19/80	111	42	60

TW 140

<u>Date</u>	<u>COD mg/l</u>	<u>TOC mg/l</u>	<u>BOD mg/l</u>
2/79	125	29	-
10/79	55	47	
pump off			
12/14/79			
pump on			
2/14/80			
2/19/80	50	42	6
3/19/80	57	36	4

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### Conclusions and Recommendations

Water quality analyses have confirmed the presence of groundwater contamination on the subject site. The presence of organic solvents were undoubtedly due to operations of the former solvent recovery plant. The routine monitoring of two purge wells however, have shown that the presence of these organic solvents are no longer detected. Discussions with Dr. Dave Howard of Howard Laboratories has revealed the presence of small concentrations of Acetic Acid within groundwater samples. The presence of this weak acid is most likely the result of the former sludge drying beds. This condition may be expected to remain for a considerable period of time.

Analytical results dated March 10, 1980 indicate that any detected heavy metals are present in concentrations below the primary drinking water standards. These latest lab results also suggest that any degradation of the groundwater quality is most likely due to long term conditions and are not the result of Systech's plant operation. These long term conditions can be attributed not only to the previous operation of this facility as a wastewater plant but also perhaps due to the inclusion of effluent from the former Logan-Long Mill. The proximity of TW 132 to this former channel also suggests the possible long term effect of previous contamination in this area. TW 132 is located upgradient from any sources of contamination originating within the plant proper. However, as discussed in our report of October 23, 1979, a reversal of groundwater flow may be possible due to the relatively flat hydraulic gradient. This would have resulted in contaminants moving in an otherwise upgradient direction. The continued operation of purge well Nos. 139 and 140 has tended to maintain the direction of groundwater movement towards the northwest and has also accelerated its rate of movement. The inclusion of inferior water quality within TW 132 therefore appears to be partially the result of other offsite and upgradient sources.

The analytical results of water samples collected from purge well Nos. 139 and 140 after three months of inoperation indicate that the minimum COD and BOD levels are re-established after short periods of pumping. This condition together with Dr. Howard's discussion pertaining to the relationship between existing bacteria and acetic acid in the area of the former sludge drying beds tends to explain the COD and BOD levels. It is doubtful that continued purging of the groundwater would result in further and continued reduction of these parameters. The continued operation of TW 139 and TW 140, therefore, appears to offer minimal benefit in the general improvement in groundwater quality.

If you have any questions concerning these opinions, I would be pleased to discuss them with you.

Respectfully submitted,



Walter Meinert, P.E.  
Consulting Engineer

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